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Delaware Immunization Program

ACHIEVING IMMUNIZATION PROGRAM PRIORITIES: CONSIDERATIONS FOR IMMUNIZATION INFORMATION SYSTEM IMPROVEMENT

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1. INTRODUCTION

The Delaware Immunization Program, with the leadership and support of the Delaware Department of Health and Social Services (DHSS), operates a statewide immunization information system (IIS). IISs are arguably the most powerful tool available to increase immunization coverage rates, decrease the incidence of vaccine-preventable diseases, and improve the quality of immunization practice in private and public settings. The Delaware IIS, known as VACAttack, is intended to serve as the data backbone of the Immunization Program and is relied upon as a resource to store and recall individual immunization information and support overall Program needs. VACAttack was developed in 1995 and, now aging, fails to meet current demands. As such, the Immunization Program has pursued additional federal stimulus funding to improve registry functionality. As a condition for funding, the Centers for Disease Control and Prevention requested that the Immunization Program clarify its registry development plans. To that end, a joint planning session was conducted on January 6, 2010 to achieve the following objectives:

1. To gain clarity on Immunization Program priorities for a 5-year planning horizon.
2. To reach agreement on a proposed approach and schedule to improve the Delaware immunization registry while addressing known or expected constraints.

Participants in the joint planning session included representatives from the Immunization Program, the Immunization Registry, CDC, and Public Health Informatics Institute (PHII), a CDC technical assistance partner:

DHSS	▪ *Martin Luta, MD*, Chief, DHSS Bureau of Communicable Disease ▪ *Fred Bailey*, DHSS Health Program Coordinator ▪ *Tim Egan*, CDC Public Health Advisor, Acting Program Manager, Delaware Immunization Program ▪ *Kendall Patterson*, Information System Support Specialist, DHSS, Division of Public Health
CDC/NCIRD	▪ *Bobby Rasulnia, LT USPHS, PhD, MPA, MPH, CHES* Senior Research Scientist, NCIRD/ISD/IISSB
PHII	▪ *Laura Ripp, RN, MPH, MBA, PMP*, Senior Public Health Advisor

2. PURPOSE

The Immunization Program views registry improvement efforts as an imperative to enable achievement of strategic programmatic priorities in pursuit of its mission to "prevent and control the transmission of vaccine preventable diseases through the support and implementation of interventions aimed at increasing immunization rates." This report summarizes Program priorities, describes immunization registry functionality required to support these priorities, and establishes the basis for a rational approach to registry improvement.

3. DELAWARE IMMUNIZATION PROGRAM STRATEGIC PRIORITIES

Using a five-year horizon, seven major areas were identified as strategic priorities for the Immunization Program that must be supported to enable achievement of mission-critical activities. Table 1 summarizes responses by Program and Registry personnel to indicate whether VACAttack currently satisfies the registry requirements for each Program priority. A "No" response indicates that VACAttack does not currently satisfy Program needs. In cases where the response is "Partial" and the registry mostly meets Program needs, the Partial response is noted to be "high" (P^H); if the registry offers minimal capability, the Partial response is noted to be "low" (P^L). There were no "Yes" responses; a finding consistent with the recognition that Delaware's IIS is in critical need of improvement.

Table 1. Immunization Program Priorities and Current Registry Capabilities

DE Immunization Program Priorities [5- year horizon]	Can VACAttack currently satisfy Program needs? **N**o / **P**artial / **Y**es		
1. Perform/support ad hoc surveillance and response projects	N		
2. Identify gaps in immunization coverage	N		
3. Support provider need for accurate, complete imm'n information		P	
4. Support stakeholder engagement and retention		P	
5. Support daily operations	<See 5.1-5.7>		
5.1. Vaccine-preventable disease follow-up/case management		P	
5.2. Vaccine accountability, management and inventory	N		
5.3. Training for registry users (initial and ongoing)	N		
5.4. Maintain linkages to key data sources		P^H	
5.5. Support focused, timely communication (internal/external)		P^L	
5.6. Reporting (CDC, ARRA, other)		P^L	
5.7. Respond to queries; policy support for DPH, legislators, CDC, public at large, etc.	N		
6. Support for nontraditional registry functions, e.g., BMI, newborn screening, lead cases, etc.	N		
7. Monitor provider activity/use of the registry	N		

4. REGISTRY FUNCTIONS REQUIRED TO MEET PROGRAM PRIORITIES

Table 2 describes the specific immunization registry functionality that Program and Registry personnel indicate would be required to satisfy the Delaware Immunization Program priorities as defined for the next five years.

Table 2. Immunization Program Priorities and Required Registry Capabilities

DE Immunization Program Priorities [5- year horizon]	Required Immunization Registry Functions
1. Perform/support ad hoc surveillance and response projects	■ Capability to generate form-based surveys and dynamically assign data elements to events. ■ Capability to store event-/project-specific data ■ Capability to perform data extraction ■ Capability to support statistical analyses ■ Capability to perform ad hoc (non-standard) reporting ■ Capability to support user-managed survey creation, data analysis and reporting for special projects as they are defined
2. Identify gaps in immunization coverage	■ Capability to capture immunization and related data ■ Capability to store complete data sets ■ Capability to perform complex queries to support data stratification ■ Capability to support statistical analyses ■ Capability to support geographic mapping functions, geocoding, etc. ■ Capability to perform data representation, graphing functions
3. Support provider need for accurate, complete imm'n information	■ Capability to perform deduplication of records ■ Capability to support data quality assurance functions (scrubbing) to migrate reliable information to the registry from external systems ■ Capability to capture and store immunization information from numerous external sources and make it available to providers in a timely manner

DE Immunization Program Priorities [5- year horizon]	Required Immunization Registry Functions
4. Support stakeholder engagement and retention	■ Capability to capture stakeholder identification and characteristics, i.e., for health plans, providers, etc. ■ Capability to receive data from external systems in multiple formats, including, but not limited to, HL7 ■ Capability to perform data validation ■ Capability to perform stakeholder-specific analyses to support value-added services, e.g, HEDIS reporting, reminder/recall notifications, etc. ■ Capability to support stakeholder-specific report formats and generate reports ■ Capability to support automatic, periodic transmission of stakeholder reports to named recipients
5. Support daily operations	[Functions described in 5.1 – 5.7]
5.1. Vaccine-preventable disease follow-up/case management	■ Capability to perform complex queries to support data stratification ■ Capability to analyze sub-population and full population data ■ Capability to support search for specific cases ■ Capability to support VPD case-specific templates ■ Capability to display results ■ Capability to generate structured reports ■ Capability to generate ad hoc reports ■ Capability to record specific case observations using forms-based tools

DE Immunization Program Priorities [5- year horizon]	Required Immunization Registry Functions
5.2. Vaccine accountability, management and inventory	■ Capability to interface with an external system (McKesson) to capture vaccine distribution data ■ Capability to support communication from provider systems (e.g., vaccine inventory data) to the registry ■ Capability to perform reconciliation between amounts distributed to and amounts reported by providers ■ Capability to perform decision support functions regarding vaccine order quantities
5.3. Training for registry users (initial and ongoing)	■ Capability to support training videos ■ Capability to provide contextual “help” functions within the registry application ■ Capability to support audio/video enabled “help” functions within the registry application ■ Capability to provide access to printable registry reference and “how to” guides ■ Vendor-assisted Help Desk (direct technical) support
5.4. Maintain linkages to key data sources	■ Capability to support bidirectional connectivity to target databases ■ Capability to provide “intelligent” interfaces to support specific data calls ■ Capability to support numerous small, custom interfaces ■ Capability to monitor changes in status of connections

DE Immunization Program Priorities [5- year horizon]	Required Immunization Registry Functions
5.5. Support focused, timely communication (internal/external)	■ Capability to support a resource email account, i.e., a general mailbox ■ Capability to generate and submit communication content ■ Capability to enable/disable specific bidirectional communication channels ■ Capability to set time (and other) parameters for communication content ■ Capability to enable decision points/action steps within communication content to achieve specific outcomes, e.g., acknowledgement of receipt, feedback, etc.
5.6. Reporting (CDC, ARRA, other)	■ Capability to develop standard reports for timely, periodic use ■ See functions in 5.7
5.7. Respond to queries; policy support for DPH, legislators, CDC, public at large, etc.	■ Capability to perform complex queries to support data stratification ■ Capability to support ad hoc report design and generation ■ Capability to support complex reporting, e.g., interface with 3rd party report tools such as Crystal Reports.
6. Support for nontraditional registry functions, e.g., BMI, newborn screening, lead cases, etc.	■ Capability to capture and store additional data ■ Capability to view additional data ■ Capability to perform complex queries ■ Capability to support reports using integrated data sets ■ Capability to support role-based permissions, access controls and other user-related confidentiality safeguards
7. Monitor provider activity/use of the registry	■ Capability to support and maintain a statewide provider directory ■ Capability to support user activity logs and audit capability ■ Capability to support user query logs ■ Capability to support options in presentation layer, e.g., user-defined look and feel ■ Capability to support provider communication (see 5.5)

5. Extent of the Gap Between Current and Required Registry Functionality

Table 3 is intended to represent the general level of technical effort required to close the gap between the current functionality of VACAttack and what Immunization Program and Registry personnel identify as the registry functionality required to support Program priorities. Information from Table 1 is also incorporated here as a reference to current registry capabilities relative to Program needs and a list of key issues and challenges with VACAttack as described by the Delaware team is provided as Appendix A. It should be noted that among 8 of 13 distinct Program priority areas, the technical effort to implement the required functionality in the current registry is felt to be "large".

Table 3. Extent of the Gap Between Current and Required Registry Capabilities

DE Immunization Program Priorities [5- year horizon]	Can VACAttack satisfy Program priorities?*	Extent of Gap Between Current and Required Registry Functionality **S**m / **M**ed / **L**g		
1. Perform/support ad hoc surveillance and response projects	N			L
2. Identify gaps in immunization coverage	N			L
3. Support provider need for accurate, complete imm'n information	P			L
4. Support stakeholder engagement and retention	P	S		
5. Support daily operations	<5.1-5.7>			
5.1. Vaccine-preventable disease follow-up/case management	P			L
5.2. Vaccine accountability, management and inventory	N		M	
5.3. Training for registry users (initial and ongoing)	N			L
5.4. Maintain linkages to key data sources	P^H	S		
5.5. Support focused, timely communication (internal/external)	P^L		M	
5.6. Reporting (CDC, ARRA, other)	P^L		M	L
5.7. Respond to queries; policy support for DPH, legislators, CDC, public at large, etc.	N			L
6. Support for nontraditional registry functions, e.g., BMI, newborn screening, lead cases, etc.	N			L
7. Monitor provider activity/use of the registry	N			L

* As per Table 1, **N** = No, VACAttack does not satisfy Program needs; **P** = Partially satisfied; **Y** = Yes, fully satisfied

6. Assumptions and Constraints

Program and Registry personnel reviewed assumptions and discussed actual and potential constraints that must be factored into a decision to pursue a custom coded solution ("build") or a commercially available solution ("buy") to implement registry improvements. Relevant assumptions and constraints include:

A. Cost. The approach to implement registry improvements cannot exceed $385,444 in federal stimulus funding to be made available to Delaware by CDC. The funding application is a Financial Assistance (FA) request.

B. Schedule. Rapid deployment is required. Project funding must be encumbered by the end of the 18 month period (approximately March 2011) as stipulated in the ARRA Program Requirements.

C. Customization. Complex functionality such as forecasting, reminder/recall, immunization coverage reporting and deduplication do not exist in the current solution. Therefore, improvements in the registry as required to meet Immunization Program goals could require some degree of customization which should be factored into the total cost of solution development and maintenance.

D. Sustainability. The chosen registry solution must be financially and technically sustainable, i.e., the solution should include consideration of defined mechanisms to ensure long-term availability and productive use.

   i. Ongoing maintenance and support. The ongoing cost of registry maintenance and support must not exceed the amount of federal grant funding allocated to the registry (Section 317 program funds).

   ii. Access to required skills. Human resource factors must be considered in the operating plan for the registry. The skills and knowledge required to support the registry must be readily accessible.

E. Procurement. Possible registry solutions must be acquired through accepted procurement and contracting mechanisms. This may include purchasing from the State's pre-approved vendor list or solicitation of offerings through issuance of a Request for Proposals.

F. Project Approval. The project schedule should anticipate requirements for State and federal approvals.

7. OPTIONS FOR IIS IMPROVEMENT

Five options were initially identified as potential approaches to improve immunization registry functionality in order to satisfy the needs and priorities of the Delaware Immunization Program. After discussion, the "maintain status quo" and "outsource registry" options were eliminated. Three options for IIS improvement will be further evaluated. These include:

A. Adopt a registry product currently in use by another state.

B. Procure a commercial off-the-shelf (COTS) registry solution.

C. Develop a "pseudo-custom" solution by building or buying a new presentation layer with the required logic and integrating it with the existing registry database.

8. Next Steps to Confirm Delaware's Approach to Registry Improvement

The following near term actions will be taken to gather additional information regarding each of the potential options for registry improvement:

- By January 31, 2010, CDC will assist in scheduling at least four remote live demonstrations of registry solutions currently in use. The solutions previewed will range from COTS products to state-developed registries. Information on contract terms/scope of work, cost, and other factors will also be requested.
- By January 20, 2010, Delaware (Registry Manager) will define the state procurement process applicable to each of the three options. The process description should minimally include: a) the estimated timeline; b) specific action steps; and c) special considerations for ARRA funds.
- By January 20, 2010, Delaware (Registry Manager) will describe the plan required to pursue the "pseudo-custom" solution option.
- By January 31, 2010, the Delaware team will reconvene by teleconference to discuss findings, impressions and any remaining next steps required to confirm a decision on the preferred approach to registry improvement.
- By February 12, 2010, the Delaware team will confirm a decision on the preferred approach to registry improvement.

APPENDIX A: SUMMARY OF CURRENT ISSUES AND CHALLENGES WITH VACATTACK

VACAttack, the current immunization registry in use by the Delaware Immunization Program, is a significant target for improvement as it does not currently meet programmatic needs and is generally deficient in functional capabilities as compared with the CDC-endorsed functional standards for immunization registries. The Delaware team (as listed on Page 1 of this report) described and demonstrated key issues and challenges with VACAttack. A summary of those issues is presented here.

1. The current registry lacks the capability to support core functionality including:
    a. Support for reminder/recall notification
    b. Immunization coverage reporting
    c. Vaccine inventory management
    d. Vaccine forecasting to determine routine immunizations needed
    e. Exchange records using HL7 standards
2. The registry cannot currently support the requirements for pandemic influenza management.
3. The Master Client Index (MCI) for the registry is controlled at the Department level (DHSS) and must be reconciled with numerous demographic databases.
4. Deduplication of records and discrete immunizations is a fully manual, highly time-consuming process currently being addressed by the Registry Manager.
5. The registry is a highly customized proprietary solution with several components that have been rendered inoperable due to unresolved software coding conflicts. Performance issues are common.
6. There are no direct feeds of electronic birth certificate data to the registry. The vital records system is housed in a non-state database which is problematic for timely receipt of this essential information. There are currently no connections from birthing hospitals to the registry.
7. Value received by providers using the registry is minimal. Participating providers may access a read only, web-based interface to view immunization histories.
8. Immunization data is captured by entry of paper-based immunization records as well as some electronic file transfer from participating stakeholders. Timeliness of data availability must be improved.
9. Reporting is accomplished using custom scripts and data extraction to support analyses is not generally able to be performed by program staff.